MURRAY WATER WORKS- ALDER CREEK
SOURCE WATER ASSESSMENT REPORT

November 6, 2000

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the watershed characteristics.

This report, *Source Water Assessment for Murray Water Works- Alder Creek (1400039)*, describes the public drinking water system, the zone boundary of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Murray Water Works drinking water system consists of one surface water intake and one well. The focus of this report will be the surface water intake on Alder Creek. A future report will address the groundwater source. While the surface water source has shown no inherent water quality problems other than turbidity, in order to meet the requirements of the Surface Water Treatment Rule, Murray Water Works has chosen to provide water to their consumers solely from their groundwater source in the future. This was determined to be preferable to installing a filtration system on their surface water intake. At this time Murray Water Works is in the process of making the switch from surface water to groundwater. This includes installing new water mains within the town. Water samples taken from the existing system have often shown relatively high levels of total coliform bacteria, probable resulting from the poor condition of the existing distribution system.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Murray Water Works should focus their source water protection activities on implementation of practices aimed at reducing the effects of turbidity in the Alder Creek watershed until the transition to groundwater is complete. The entire Alder Creek watershed has been logged, increasing the potential for high levels of sediment in water entering the drinking water intake. Increased levels of sediment in drinking water can lead to difficulty disinfecting it. Murray Water Works does not own most of the Alder Creek watershed so partnerships with state and local agencies and private landowners should be established and are critical to success. Due to the fairly short time associated with the movement of surface waters, source water protection activities should be aimed at short-term management strategies to control turbidity. Development of long-term management strategies may not be necessary for the Murray Water Works surface water intake, as a complete switch to groundwater is anticipated in the near future.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact your regional IDEQ office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR MURRAY WATER WORKS- ALDER CREEK

Section 1. Introduction- Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area, a map showing the entire watershed contributing to the delineated area and the inventory of significant potential sources of contamination identified within the delineated area are attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the intakes and watershed characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

Murray Water Works- Alder Creek serves a community of approximately 34 people. The intake is located on Alder Creek one half mile upstream from the town of Murray, Idaho. (Figure 1). The Murray Water Works public drinking water system is comprised of one surface water intake and one groundwater source. At this time the groundwater source is only serving approximately 12 of the 22 connections in the drinking water system.

The primary water quality issue currently facing Murray Water Works is that of turbidity and the problems associated with managing it. Over the years water from the surface water intake has often revealed relatively high levels of total coliform bacteria. This may be the result of increased levels of turbidity in the water or may reflect problems with the distribution system, which is antiquated and in disrepair. Murray Water Works is in the process of installing new water mains in the town of Murray so that they can provide water to their users solely from their groundwater source. This should result in fewer coliform-containing water samples.

Defining the Zones of Contribution- Delineation

To protect surface water systems from potential contaminants, the EPA required that the entire drainage basin be delineated upstream from the intake to the hydrologic boundary of the drainage basin (U.S. EPA, 1997b). The EPA recognized that an intake on a large water body could have an extensive drainage basin. Therefore, the EPA recommended that large drainage basins be segmented into smaller areas for the purpose of implementing a cost-effective potential contaminant inventory and susceptibility analysis. The delineation process established the physical area around an intake that became the focal point of the assessment. For small surface water systems like Murray Water Works, the segmentation process was not required.

The delineated source water assessment area for Murray Water Works- Alder Creek can best be described as somewhat oval-shaped, extending from the intake in a northeasterly direction, encompassing the entire Alder and East Fork drainages. The actual data used by IDEQ in determining the source water assessment delineation area are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of surface water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.

The dominant land uses in the area surrounding the Alder Creek intake are logging, mining and undeveloped, forested land.

Land use within the town of Murray consists of residential homes and small establishments. Homes and establishments within the town of Murray are located below the Alder Creek intake.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply intake.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during the spring of 2000. The first phase involved identifying and documenting potential contaminant sources within the Murray Water Works-Alder Creek source water assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. The second or enhanced phase of the contaminant inventory involved conducting an on-the-ground identification of potential sources and validation of sources identified in phase one. This task was undertaken with the assistance of Harry Almquist.

A total of three potential contaminant sites are located within Alder Creek's delineated source water area (see Table 1). Two of the potential contaminant sources are mines. The other source is logging activity that has been recorded in the entire Alder Creek watershed. (Figure 1). Table 1 summarizes the potential contaminants of concern and information source.

Figure 1. Geographic Location of Murray Water Works

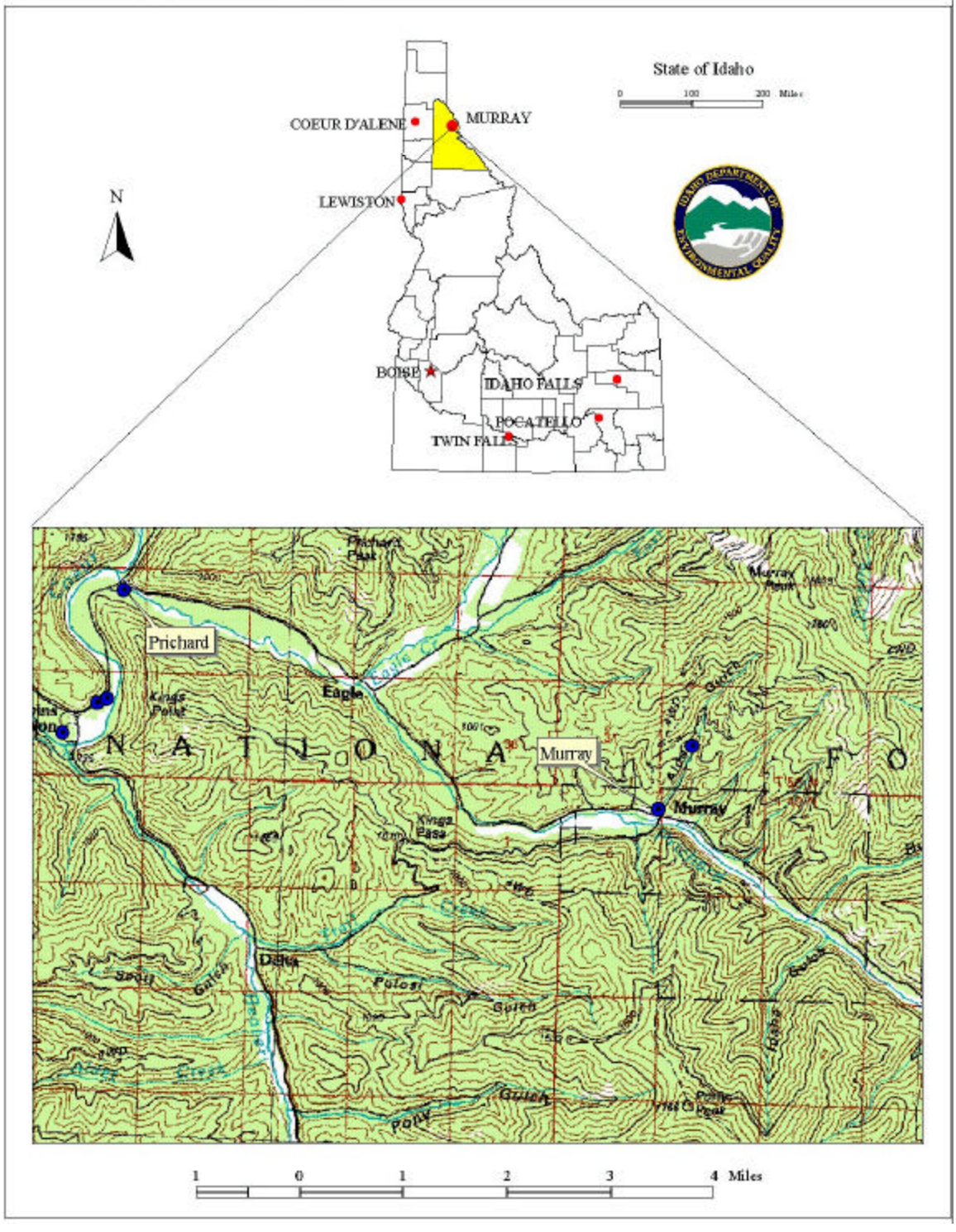

Figure 2. Murray Water Works Delineation and Potential Contaminant Inventory.

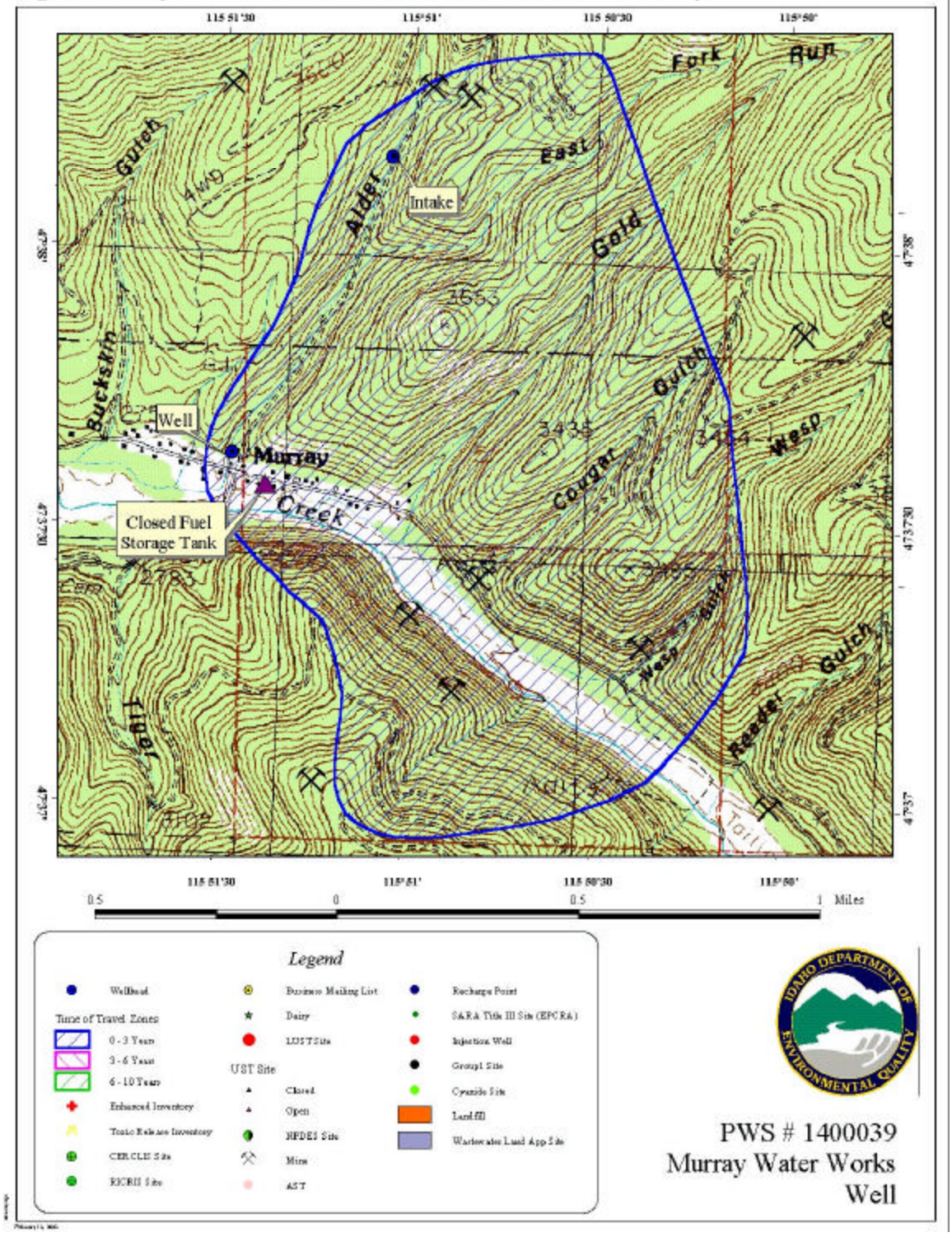

Table 1. Murray Water Works Potential Contaminant Inventory

SITE #	Source Description	Source of Information	Potential Contaminants
1	Mine- Lead	Database Search	IOC
2	Mine- Lead	Database Search	IOC
3	Logging Activity	Enhanced Inventory	Turbidity

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Analysis

Significant potential sources of contamination were ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity and construction of the intake, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each intake is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Intake Construction

The construction of the Murray Water Works- Alder Creek public water system intake directly affects the ability of the intake to protect the source from contaminants. The Murray Water Works drinking water system consists of one surface water intake that produces surface water for domestic use. There is also a groundwater source that is serving some of the system's connections. Water production is monitored and managed by the system operator. The intake system construction score was moderate, reflecting the fact that the intake is constructed in a way that provides protection from potential contaminants, but is not located in an infiltration gallery.

The Murray Water Works- Alder Creek intake is located approximately one half mile upstream of the town of Murray in Shoshone County, Idaho.

Potential Contaminant Source and Land Use

The surface water intake rated in the moderate category for the inorganic chemical class and rated in the low category for volatile organic chemicals and synthetic organic chemicals.

In terms of the total susceptibility score, it can be seen from Table 2 that the surface water intake showed a low susceptibility for microbial contamination.

Table 2. Summary of Murray Water Works- Alder Creek Susceptibility Evaluation

	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
Intake	IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Alder Creek	L	L	L	L	M	M	L	L	L

H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
H* - Indicates source automatically scored as high susceptibility due to presence of either a VOC, SOC or an IOC above the Maximum Contaminant Level in the finished drinking water.

Susceptibility Summary

The Murray Water Works- Alder Creek intake is currently threatened by high levels of bacteria related to increased turbidity as a result of logging activity in the watershed and the poor condition of the distribution system. The proximity of two lead mines to the drinking water intake has resulted in the intake receiving a moderate susceptibility rating for inorganic contaminants.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. Murray Water Works should focus their efforts on completing necessary upgrades to the distribution system so that they can complete the transition to groundwater, thus eliminating the problems associated with turbidity in the Alder Creek watershed. In the meantime, they should focus their source water protection activities on reducing the impacts of storm water runoff within the delineated source water area. This can be accomplished by forming partnerships with state and local agencies and private landowners and possibly by reviewing the Idaho Forest Practices Act to determine if logging activity in the area has been completed according to established rules and regulations. Source water protection activities for the Alder Creek intake should be aimed at short-term management strategies since the system will be switching to a groundwater source in the near future.

Assistance

Public water suppliers and others may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office	(208) 769-1422
State IDEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

References Cited

Idaho Department of Lands, 1996. Rules Pertaining to the Idaho Forest Practices Act Title 38, Chapter 13, Idaho Code.

Attachment A

Murray Water Works – Alder Creek Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined from the addition of the Potential Contaminant Source/Land Use Score and Source Construction Score.

Final Susceptibility Scoring:

0 - 7 Low Susceptibility

8 - 15 Moderate Susceptibility

> 16 High Susceptibility

Surface Water Susceptibility Report Public Water System Name : MURRAY WATER WORKS Intake: ALDER CREEK

Public Water System Number 1400039 9/22/00 11:49:47 AM

1. System Construction		SCORE
Intake structure properly constructed	YES	0
Infiltration gallery or well under the direct influence of Surface Water	NO	2
Total System Construction Score		2

2. Potential Contaminant Source / Land Use		IOC Score	VOC Score	SOC Score	Microbial Score
Predominant land use type (land use or cover)	BASALT FLOW, UNDEVELOPED, OTHER	0	0	0	0
Farm chemical use high	NO	0	0	0	
Significant contaminant sources *	NO				
Sources of class II or III contaminants or microbials	present within a 1-mile radius and upstream	2	0	0	0
Agricultural lands within 500 feet	NO	0	0	0	0
Three or more contaminant sources	NO	0	0	0	0
Sources of turbidity in the watershed	YES	1	1	1	1
Total Potential Contaminant Source / Land Use Score		5	1	1	1
3. Final Susceptibility Source Score		7	3	3	3
4. Final Source Ranking		Moderate	Low	Low	Low

* Special consideration due to significant contaminant sources
The source water has no special susceptibility concerns

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.